Agriscience (HQ)

Description

Agriscience is a laboratory science course that prepares students for biology, subsequent science courses and post-secondary pursuits. The content area includes ecology, biological processes, sexual and asexual reproduction and a study of the chemical and physical laws that govern life processes. This course helps students understand the important role agricultural science serves as industry moves into the 21st century.

Note: It was the consensus of both the industry representatives and the teachers that a student who receives credit in Agriscience should not be awarded credit in Principles of Agricultural Sciences and a student who receives credit in Principles of Agricultural Sciences should not be awarded credit in Agriscience (HQ).

Pre-Requisites: None

Recommended Credit(s): 1

Recommended Grade Level: 9th

Course Codes:** A10 – **5121** or A12 - **5171**

** Use A12 Course Code number for all programs. A10 should be used for 10 month programs only.

Agriscience (HQ)

Standard 1.0

Evaluate the use of the scientific investigation to supply the world with needed agricultural products.

Standard 2.0

Explain the importance of agriculture in society.

Standard 3.0

Determine the importance of wildlife populations and environmental conditions in our natural habitats.

Standard 4.0

Explain the major cell processes as related to plant and animal systems.

Standard 5.0

Examine the genetic activity and reproductive systems as related to plant and animal.

Standard 6.0

Examine the functions of the animal digestive system of the major types of domestic animals.

Standard 7.0

Analyze the nutritional requirements for plants and animals.

Standard 8.0

Analyze cell structure, genetics and reproduction of plants.

Standard 9.0

Evaluate different methods by which electrical energy can be produced and used.

Standard 10.0

Demonstrate premier leadership and personal growth needed in the area of agriscience.

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Standard 1.0

Evaluate the use of scientific investigation to supply the world with needed agricultural products.

Learning Expectations and Performance Indicators:

1.1 Summarize terms that relate agriculture and science.
1.2 Describe events that have influenced agriscience education.
1.3 Explain the scientific investigation process.
1.4 Prepare an outline for and make a presentation on an agricultural science project.
1.5 Determine the benefits of conducting a supervised agricultural experience program (SAEP) as it relates to science.
1.6 Describe the function of competition in the science learning process.
1.7 Describe the impact of technological developments on agriculture and their effect on the lifestyle of society.

Standard 2.0

Explain the importance of agriculture in society.

Learning Expectations and Performance Indicators:

2.1 Summarize the importance of agriculture to Tennessee's economy.
2.2 Determine why agriculture is important to Tennessee's economy.
2.3 Explain the role of the major careers in agriscience and agriculture.
2.4 Explain the political impact of agriscience at the local, state, national and international levels.
2.5 Analyze the impact of technological advancement in agriculture.
2.6 Describe the role of genetics in the agricultural industry.
2.7 Analyze the relationships of plants and animals in our society.
2.8 Analyze the desired effects of leadership on world agriculture production.

Standard 3.0

Determine the importance of wildlife populations and environmental conditions in our natural habitats.

Learning Expectations and Performance Indicators:

3.1 Summarize terms associated with ecology and conservation.
3.2 Analyze the major components of a food chain in nature.
3.3 Analyze the main parts of the water cycle.
3.4 Examine the main flow of carbon dioxide and oxygen between plants and animals.
3.5 Diagram the parts of the nitrogen cycle.
3.6 Distinguish types of pollution and their sources.
3.7 Determine how the carrying capacity of an ecosystem is affected by interactions among species and organisms.

Standard 4.0

Explain the major cell processes as related to plant and animal systems.

Learning Expectations and Performance Indicators:

4.1 Examine the parts of the cell and explain their functions.
4.2 Identify the cellular organelles associated with major cell processes.
4.3 Distinguish among proteins, carbohydrates, lipids, and nucleic acids.
4.4 Determine the relationship between cell growth and cell reproduction.
4.5 Describe the relationships among genes, chromosomes, proteins, and hereditary traits.
4.6 Analyze the role of genes in determining hereditary characteristics.
4.7 Describe the procedure determining the genetic makeup and the sex of animal offspring.
4.8 Summarize the terms associated with plant and soil chemistry.

Standard 5.0

Examine the genetic activity and reproductive systems as related to plant and animal.

Learning Expectations and Performance Indicators:

5.1 Summarize terms related to cell structure and genetics.
5.2 Diagram seed parts and factors that affect seed germination.
5.3 Distinguish between sexual and asexual reproduction.
5.4 Diagram parts of the flower and give the function of each part.
5.5 Summarize terms associated with animal reproductive systems.
5.6 Specify and explain the parts of an animal's reproductive system.
5.7 Specify and explain the different methods of animal reproduction.

Standard 6.0

Examine the functions of the animal digestive system of the major types of domestic animals.

Learning Expectations and Performance Indicators:

6.1 Summarize terms associated with livestock nutrition.
6.2 Classify domestic animals based on their digestive systems.
6.3 Describe the types of digestive systems found in domestic animals.
6.4 Discuss terms associated with metabolism in animals.
6.5 Explain and diagram the parts of an atom.
6.6 Evaluate the atomic chart and diagram the periodic table.
6.7 Compare ionic bonding and covalent bonding.
6.8 Distinguish between elements, compounds and mixtures.
6.9 Diagram the parts of a molecular equation.
6.10 Compare properties of acids, bases and salts.
6.11 Evaluate the various stages within the digestive process.
6.12 Describe nutrient requirements and the functions of domestic animals.
6.13 Differentiate types of performance rations.

Standard 7.0

Analyze the nutritional requirements for plants and animals.

Learning Expectations and Performance Indicators:

7.1 Relate plants to their preferred optimum pH ranges.
7.2 Recommend elements needed by plants.
7.3 Analyze and distinguish the symbols of elements needed for plant growth.
7.4 Specify nutrient deficiencies in plants.

Standard 8.0

Analyze cell structure, genetics and reproduction of plants.

Learning Expectations and Performance Indicators:

8.1 Diagram the parts and functions of plant cells.
8.2 Balance the parts of chemical equations related to plant processes.
8.3 Examine the importance of the cohesion theory.
8.4 Examine the effects of different colors of light on plant growth.

Standard 9.0

Evaluate different methods by which electrical energy can be produced and used.

Learning Expectations and Performance Indicators:

9.1 Summarize terminology relative to power and energy.
9.2 Analyze the relationship between speed, distance and time.
9.3 Relate principles of physics to procedures for measuring work, power and horsepower.
9.4 Specify groups, sources and forms of energy.
9.5 Describe the law of conservation of energy.
9.6 Relate the types of simple machines to the law of machines and mechanical advantages.
9.7 Analyze the principle of heat energy and describe the way heat travels.
9.8 Examine the electron theory of electricity.
9.9 Determine voltage, amperage, resistance and wattage utilizing the appropriate instruments.
9.10 Relate physics concepts to agriscience applications.
9.11 Differentiate between the types of engines.
9.12 Explain the production of energy and relate it to the invisible light spectrum.
9.13 Describe the function of the major parts of the gasoline and diesel fuel systems.
9.14 Compute horsepower.
9.15 Calculate mechanical and thermal efficiency in internal combustion engines.
9.16 Specify the basic applications of thermodynamics.
9.17 Prescribe safe practices for handling electrical power supplies.
9.18 Perform conversions from the metric to the English system.

Standard 10.0

Demonstrate premier leadership and personal growth needed in the area of agriscience.

Learning Expectations and Performance Indicators:

10.1 Demonstrate a positive work ethic and attitude.
10.2 Demonstrate proper time management skills.
10.3 Apply problem-solving skills.
10.4 Describe career plans that develop critical life-long thinking skills and allow for life long learning.
10.5 Demonstrate the ability to conduct a meeting in accordance with Robert's Rules of Order.